

Framing and Responsibility in Decision-Making: An Examination of Prospect Theory and Fuzzy-Trace Theory

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Several previous studies found that information which is presented differently — hereinafter referred to as ‘framing’ — would result in different decisions. This research proposes and examines two different theories to determine which one is more effective at explaining a phenomenon, as well as two influential conditions regarding whether it is more challenging to an individual’s decision to take a risk or avoid the risk. These conditions are: arranging alternative decisions; and the level or responsibility for a decision, concerning previous investment. This research employed an experimental study method, using a 2 x 2 x 2 subject design. There were 180 participants. The analysing instrument to examine the hypothesis was a crosstab. The findings showed that decision-making was different when the information was positively or negatively framed, and when a person was taking the full responsibility of an investment or not taking the full responsibility upon the initial investment, as well as the different preferences while using different theories.

Keywords: *Framing, Responsibility, Prospect theory, Fuzzy-trace theory.*

Background

Information is an essential need for both the internal, and external parties of a corporation. The information which is used by an internal party could be in the form of a consideration in taking concerning decisions to strategy, which will be applied in conducting the present or further corporate operational activities, as well as to determine its controls. This accounting

task requires all accountants to create considerations in collecting and providing information for the managers to be used in making decisions. There are also possibilities that the managers decide or confirm their decisions based on the provided accounting information, without considering its content. Thus, the resulting managerial decision from such deviation causes disadvantages for both the corporation, and its shareholders (Ashton, 1988).

There are several studies about making decisions, which indicate that individuals generally use a ‘*rule of thumb*’ method in making decisions. One of them, is the mode of the presented information, which hereinafter is referred to as ‘*framing*’. *Framing* deals with an individual's mode in experiencing or structuring a certain decision (Main, 1998). According to Anderson (1999), the typical mistake in making a decision consists of two matters. First, *confirming* or the *evidence trap*, which is a bias leading to seek only appropriate information to what has been believed by ignoring any contradictory information. Second, *framing up*, which is our modes in making decisions, and which mostly determine how an individual sees the choice or our modes in arranging the surrounding questions, and information.

The influences of *frame* or *framing* is a phenomenon which shows that the decision makers would respond in a different manner towards the same corporate decision, if the problems are presented in different formats (Kuhberger 1995). The *Prospect theory* is a theory which attempts to explain *framing* influences Tversky & Kahneman, 1979; 1986. The *Prospect theory* states that the adopted *frame* is dependent upon the faced problem formulation, norm, behaviour, and characteristic of the decision maker (Neale & Bazerman 1985). Whyte (1989) states that the adopted *frame* may allow in assisting clarification, whether the decision transition is the cause of a group interaction.

The *fuzzy-trace theory* assumes that the decision makers prefer to use simplification in presenting information, except if the decision maker could not simplify his decision choice into complex information. This theory has been used to examine *framing influence* in making various risky decisions Reyna & Brained, 1991; Reyna & Ellis, 1994. The latest study is by Chang (2002). He found that *fuzzy-trace* theory could explain more about the *framing* influence in making managerial accounting decisions than *prospect theory*.

This research compares the capability of *prospect theory*, and *fuzzy-trace theory* in explaining the *framing* effects within an investment decision context. The different theories present different *cognitive* processes, and result to an understanding of which theory could elaborate better about the decision-making process within an accounting context. It will be implicated to all accountants in designing new, and improved formats to present the information to decision makers. Furthermore, differing between the *framing*, and reflection effects needs to be done so that accountants can remain focussed on the appropriate approaches to reduce the effects of *framing* instead of reflection, when arranging an accounting report or information

system. Furthermore, the two-effect separation can be useful in determining the capabilities of the two theories in explaining the *framing* effects.

The problem formulations in this research are:

1. Comparing the capabilities of the *prospect theory*, and *fuzzy-trace theory* to explain the *framing* effects towards risky investment decisions.
2. Comparing the capabilities of the *prospect theory*, and *fuzzy-trace theory* to explain the *framing* effects, and responsibilities towards risky investment decisions.

Prospect theory and framing

The *expected utility theory* historically provides a normative-descriptive model to create risky decisions. This theory assumes that decision makers are rational individuals (Rcibert W Rutledge, 1994b) The decision makers are assumed to be capable of processing information perfectly, and determining the best option. Moreover, rational assumptions require consistency, and coherence in its taken decision. However, several studies found that rationale assumptions were frequently violated.

One of the most considered deviating factors is the adopted ‘frame’, made by decision makers Tversky and Kahneman (1981). The *frame* deals with how a mode of fact or information is disclosed. Tversky and Kahneman's (1981) *prospect theory* is as alternative explanation. The *prospect theory* states that the adopted *frame* by individuals could influence their decisions. In their study, Tversky and Kahneman (1981) used Asian disease problems to explain *framing* effects.

Prospect theory

According to this theory, in general, and as long as decision makers prepare a prospect analysis, there are two stages which occur. The first stage is a psychology editing process, which lasts to organise prospects. Meanwhile, the second stage is re-formulation of the options, option simplifications, and evaluations. During the editing stage, a certain reference point, which is neutral and determines the value as zero, will result to a decision of positive or negative deviate descriptions (profit and loss). The elements of coding from the editing process could be represented by a hypothetical value function in a letter ‘S’ shape, as a result of the subjective assessment of the decision makers. The curve is a concave right on the referent point, and a convex when it is below the referent point. With such curve shapes, an individual may have experienced loosing values of money in a big gambling event, rather than a victory of the same money amount. This is when it is in a *loss* situation, and an individual tends to be reckless in taking the risk (*risk-seeking*) because further failures would result to a lower subjective value than the successive level.

Research Hypothesis based on Prospect Theory

According to Kuhberger (1995), the word order about option result, such as ‘saved’ or ‘passed away’, determines the problem domain, such as ‘profit’ or ‘loss’, and it is correlated to the reflection effects. On the other hand, the *framing* problem, such as ‘positive’ or ‘negative’, depends on the use of omission ‘no’, which is correlated to the *framing* effects. The addition of omission ‘no’ in sentences, only changes the problem frame from positive to negative or vice versa, without changing the problem domain of profit or loss. As an example, regarding the studied Asian disease problem, the most possible combination of the *domain problem*, and *frame problem* are emphasised on the risk options by omitting ‘no’, such as presented in Table 1, and exactly on the program A, and C revisions.

Table 1: Framing Effect Analysis on Asian Disease Problem

The Problem: Imagine the United States was preparing an effort to eradicate the dangerous Asian disease, which was assumed to be capable of killing 600 persons. Two alternative programs to eradicate the disease were proposed. Each of them had consequences, as follows:

Program	Frame Problem	Domain Problem
A: 200 saved persons	Positive	Gain
B: 1/3 possibility, 600 persons will survive; 2/3 possibility, no one will survive.	Mixed	Gain
C: 400 persons will die	Negative	Loss
D: 1/3 possibility, no one will die; 2/3 possibility, 600 persons will not survive.	Mixed	Loss
The Revised Programs:		
A*: 400 persons will not survive	Negative	Gain
C*: 200 persons will survive	Positive	Loss

Based on the explanation, this research proposes several hypotheses on how the *prospect theory* explains information influences or facts presented in a *gain domain/positive frame*, *loss domain/negative frame*, *gain domain/negative frame*, and *loss domain/positive frame*, which lead to an individual's decision-making. To examine the issue, the hypotheses are presented as follows:

H1a: According to the *prospect theory*, while presenting information which is stated in a *positive frame*, and high responsibility, the decision maker will choose a risky option (*risk taker*) rather than choose a decision to avoid risk.

H1b: According to the *prospect theory*, while presenting information which is stated in a *positive frame*, and low responsibility, the decision maker will choose the option to avoid risk (*risk averse*) rather than to take risk.

H1c: According to the *prospect theory*, while presenting information which is stated in a *negative frame* and high responsibility, the decision maker will choose the risky option (*risk taker*) rather than choose a decision to avoid risk.

H1d: According to the *prospect theory*, while presenting information which is stated in a *negative frame* and low responsibility, the decision maker will choose the risky option (*risk taker*) rather than choose a decision to avoid risk.

Fuzzy-trace theory

Reyna and Brained (1990) found that *fuzzy-trace theory* (FTT) is an alternative in explaining *framing* influences. This theory is different to *prospect theory*. The FTT assumes that the individual is more likely to choose a reason which simplifies information presentation or the abstract (Reyna & Brained, 1991). According to FTT, when a decision maker is coding information word by word, he or she extracts a global pattern from the presented information, and then mentally presents a decision at a different level. This obscurity towards the word order allows a decision maker to produce a reverse option.

Research Hypothesis based on *Fuzzy-Trace Theory*

Briefly, *fuzzy-trace theory* assumes an individual is more likely to use a simplified reason of presenting information (abstract), except if the individual cannot simplify the decision due to its complexity. In other words, if the risky option is elaborated by using the *gain domain/positive frame* or *loss domain/negative frame*, the FTT predicts an individual will create a decision on the abstract level. Thus, the *framing* effect will exist.

According to the FTT, the option revision in Table 1-which uses the omission ‘no’ in the attempt of separating the *framing*, and reflection effects belongs to ess simple information unsimplified information, which cannot be performed by decision makers in the abstract level. However, it requires additional science efforts to create a decision. In this case, the *framing* effect will not exist. Thus, the hypotheses which are based on the FTT, include:

H2a: According to the fuzzy-trace theory, while presenting information which is stated in a *positive frame*, and high responsibility, the decision maker will choose the risky option (*risk taker*) rather than choose a decision to avoid risk.

H2b: According to the *fuzzy-trace theory*, while presenting information which is stated in a *positive frame*, and low responsibility, the decision maker will choose the option to avoid risk (*risk averse*) rather than choose a decision to take risk.

H2c: According to the *fuzzy-trace theory*, while presenting information which is stated in a *negative frame* and high responsibility, the decision maker will choose the risky option (*risk taker*) rather than choose a decision to avoid risk.

H2d: According to the *fuzzy-trace theory*, while presenting information which is stated in a *negative frame*, and low responsibility, the decision maker will choose the risky option (*risk taker*) rather than choose a decision to avoid risk.

Stone, et al. (1994) It can be concluded that the *fuzzy-trace theory* is more likely at explaining the *framing* effect. Additional studies that deal with *judgment*, and decision making by using the FTT include Klaczynski, P. A. (1998), and Chang (2002). Chang (2002) also states that the FTT is more likely at explaining the effects.

According to the FTT, if an additional effort is used to create a decision, and the option suggests the same *expected value* at a quantitative level, then the individuals' differences in taking risky options or their levels of confidence could reduce the impacts of the *framing* effects. Wang (2004) indicated that when the risky option of a decision maker becomes weaker, he or she could be more sensitive to the *framing* effect. However, when the risk option of a decision maker gets stronger, they would be resistant towards manipulative *framing*. Thus, in this research, it tries to compare the preferences between the *fuzzy-trace theory*, and the *prospect theory* when the problem receives both positive, and negative *framing*, and when a decision maker takes responsibility or does not take responsibility in the initial investment process. Thus, the proposed hypotheses are used to examine the preference values of each theory, as follows:

H3a: A higher *fuzzy-trace theory* preference than a *prospect theory* occurs when the information presentation into decision making is stated in positive *framing*, and high responsibility.

H3b: A higher *fuzzy-trace theory* preference than a *prospect theory* occurs when the information presentation into decision making is stated in positive *framing*, and low responsibility.

H3c: A higher *fuzzy-trace theory* preference than a *prospect theory* occurs when the information presentation into decision making is stated in negative *framing*, and high responsibility.

H3d: A higher *fuzzy-trace theory* preference than a *prospect theory* occurs when the information presentation into decision making is stated in negative *framing*, and low responsibility.

Methodology

Experimental Procedure

The applied method in collecting the data was taken from the data of the College Students of Accounting Study Program at Muhammadiyah University Magelang, as the research subjects by using the experimental method. The time allotment of the experimental research was from

Sunday, 25 February 2018 at 7:00am. The experimental promotion was intentionally done in the morning, when the participants were not exhausted and still had fresh thoughts, by assuming that the participants had not done many physical or non-physical activities.

The number of participants were 180 persons. The participants were grouped in four different rooms because the rooms did not allow the experiment with a 180-person capacity. The experiment was performed within the same time allotment and hour. It was facilitated by 12 assistants grouped across the four rooms. The job descriptions of the assistants were to assist in distributing the case questions to the participants in the first, and second stages, as well as to ensure the case question orders of each stage. Subsequently, they were asked to retrieve the questions again.

Data Analysis Method

The data obtained from the experiment was analysed. The analysis instrument was a *Cross Tabulation* assisted by the SPSS, in which it had been analysed descriptively on each participant to examine the changes occurring due to the different treatment, and measurement on the same subjects, and participants. In this research, the participants were grouped into two treatments to measure the two theories. It was performed by the *treatment of positive framing, negative framing, high responsibility, and low responsibility*.

Discussion

Participant Demography Characteristics

The participant demography characteristics consist of three main aspects: age, gender, and working experience in making decisions. The data processing pertaining to the participant demography characteristics can comprehensively be seen in Table 7.

Table 2: Statistics of Participant Demography Characteristics

	N	Minimum	Maximum	Mode	Mean	Std. Deviation
Respondent Ages	180	21	46	21 ^a	22.76	2.924
Respondent Gender Types						
Male = 35				2		
Female = 145	180	1	2		1.81	0.397
Respondent Occupation Statuses	180	1	2	2	1.66	0.477
Working experience	180	0	18	0	1.46	2.660
Valid N (Listwise)	180					

The data processing results on Table 2 show the taken participants in the research were 180 persons. The youngest participant is 21 years old, while the oldest is 46 years old. The average age of the participants' is 22.76 years old. The most frequently occurring ages of the participants is 21, and 22 years old. The genders of the participants consist of 145 female, and 35 male participants.

The demographical data also encompasses information relating to specific working experiences. This refers to the participants' experiences in making decisions within their workplaces. The results show that the 180 participants have a 1.66 years working average. The longest working experience was 18 years, with a minimum threshold of zero years or in other words, no working experience. The average of the participants' working experience was 1.46 years.

The participants in the experimental group were divided into eight *treatments* labelled from 'A' through to 'H'. Each of the participants received two treatments. The participants who were treated by 'A' while in the first experiment, would be treated by the *treatment* 'E' in the next experiment. These participants were included into *positive framing* with responsibility. The participants treated by 'B' while in the first experiment, would be treated by the *treatment* 'F' in the next experiment. These participants were included into *negative framing* with responsibility. The participants who were treated by 'C' while in the first experiment, would be treated by the *treatment* 'G' in the next experiment. These participants were included into *positive framing* without responsibility. The participants who were treated by 'D' while in the first experiment, would be treated by the *treatment* 'H' in the next experiment. These participants were included into *negative framing* without responsibility.

The participants treated by 'E' while in the first experiment would be treated by the *treatment* 'A' in the next experiment. The participants treated by 'F' while in the first experiment would be treated by the *treatment* 'B' in the next experiment. The participants treated by 'G' while in the first experiment would be treated by the *treatment* 'C' in the next experiment. The participants treated by 'H' while in the first experiment would be treated by the *treatment* 'D' in the next experiment. This was done to reduce bias in the answering of the *treatments*.

The demography characteristics of the four groups were also compared (see Table 8). The average age of the participants in each group were close to being equal. The age average of the *positive framing* with responsibility group was 22.65; the *negative framing* with responsibility group was 22.39; the *positive framing* without responsibility group was 23.23; and the *negative framing* without responsibility group was 22.79. It can be concluded that the average value across all the groups and participants is 22.76. The lowest average was found in the *negative framing* with responsibility group, with a value of 22.39. Meanwhile, the

greatest average was found in the *positive framing* without responsibility group, with a value of 23.23.

Similar to the age average, the average of working experience within each group was close to being equal. However, the highest average was found in the *positive framing* without responsibility group, with an average score of 1.91. It was followed by the *negative framing* without responsibility group, with an average of 1.72, and the *positive framing* with responsibility group, with an average of 1.18. The *negative framing* with responsibility group again had the lowest average score, at a rate of 1.05. It can be concluded that the working experience average across all groups and participants is 1.465. The lowest average score was found in the *positive framing* group with responsibility, with an average of 1.05. Meanwhile, the highest average score was found in the *positive framing* without responsibility group, at a rate of 1.91.

Analysis of 1a, 2a, and 3a Hypotheses

The analyses of the hypotheses 1a, 2a, and 3a were undertaken within the framework of the *prospect theory*, and *fuzzy-trace theory*. Specifically, the testing of each individual on the investment decisions presented in the *prospect theory*, and *fuzzy-trace theory*, *positive frame*, and high responsibility.

Table 3: High Positive Prospect vs High Positive Fuzzy

Theory	Options		Total	Chi-Square Test	P-Value
	A	B			
Prospect	22 (44.9%)	27 (55.1%)	49	0.996	0.318
Fuzzy	15 (30.6%)	34 (69.4%)	49		

The H1a testing was conducted upon each individual by using a case *treatment* symbolised by 'A'. The case was developed to describe the positively framed investment information (*positive frame*), and the answer was provided by using the *prospect theory* framework with a high responsibility. The analysis was completed by using a *cross tabulation*, as conducted by Chang, Yen, and Duh (2002) to describe the percentage of the applied *treatment* result.

As shown in Table 3, when the options are stated in the *prospect theory* by having a positive frame, and high responsibility, of the 49 participants, 22 chose the option 'A', the 'less risky' decision. Meanwhile, 27 respondents chose option 'B', the 'risk taker' decision. This result shows that 44.9 per cent of the participants selected the 'less risk' option, and 55.1 per cent selected the 'risk taker' option to keep the investment. This finding demonstrates that when the applied theory is the *prospect theory* with a positive frame, and high responsibility, the participants were inclined to select an alternative answer by taking the risk (option B). This

result is supported by previous findings from (Robert W Rutledge & Harrell, 1994). Thus, the result analytically proves that the hypothesis 1a is supported.

The H2a testing was conducted upon each individual by using the case *treatment* symbolised by 'E'. The case was developed to describe the positively framed investment information (*positive frame*), and the answer was provided by using the *fuzzy-trace theory* framework with a high responsibility. The analysis was completed by using a *cross tabulation*, as conducted by Chang, Yen, and Duh (2002) to describe the percentage of the applied *treatment* result.

Table 3 shows that when the options are stated in the FTT framework by having a positive frame, and high responsibility, of the 49 participants, 15 chose option A, the 'less risky' decision. Meanwhile, 34 respondents chose option B, the 'risk taker' decision. This result shows that 30.6 per cent of the participants selected the 'less risk' option, and 69.4 per cent selected the 'risk taker' option to keep the investment. The finding demonstrates that when the applied theory was *FTT* with a positive frame, and high responsibility, the participants were inclined to select the alternative answer by taking the risk (option B). This result is supported by previous findings from Robert W Rutledge and Harrell (1994). Thus, the result analytically proves that hypothesis 2a is supported.

The H3a analysis was a hypothesis test to examine the predictive skill of each theory. The test was done by comparing the preference level from each answer by differing the theoretical frameworks, high responsibilities, and positive information frames. As seen in Table 3, when the applied framework was the *prospect theory*, the result shows 44.9 per cent of the participants chose option A, the 'less risk' decision. Meanwhile, 55.1 per cent chose to take the risk by continuing the investment. When the testing dealt with the *FTT*, as the applied framework, it shows that 30.6 per cent of the participants chose the 'less risk' option (option A), while 69.4 per cent of them chose to take the risk by continuing the investment (option B).

In Table 3, the outcome caused no significant differences on the results. This is shown by *Chi - Square* = 0.996, and $p = 0.318$. It can be concluded that there were no differences to an individual's decision-making from the approach of either theory when the information was presented in a *positive frame*, with a high responsibility. Therefore, it can be concluded that H3a is supported systematically by using the *cross tabulation*. This finding explains the accuracy of the *FTT* prediction, rather than the *prospect theory* prediction. This finding is supported by the previous study conducted by Chang, Yen, and Duh (2002).

1b, 2b, and 3b Hypothesis Analysis

The H1b, H2b, and H3b analyses were completed by a hypothetical examination within the *prospect theory*, and the *FTT*. It was an examination of each individual towards the investment decisions presented in the *prospect theory*, and the *FTT*, with a *positive frame*, and a low responsibility.

Table 4: Low Positive Prospect vs Low Positive Fuzzy

Theory	Options		N	Chi-Square Test	P-Value
	A	B			
Prospect	30 (68.2%)	14 (31.8%)	44	0.738	0.39
Fuzzy	32 (72.27%)	12 (27.3%)	44		

The H1b testing was conducted upon each individual by using the case *treatment* symbolised by 'C'. The case was developed to describe the positively framed investment information (*positive frame*), and the answer was provided by using the *prospect theory* framework with a low responsibility. The analysis was completed by using a *cross tabulation*, as conducted by Chang, Yen, and Duh (2002) to describe the percentage of the applied *treatment* result.

As shown in Table 4, when the options are stated in the *prospect theory* by having a positive frame, and low responsibility, of the 44 participants, 30 chose the option A, the 'less risky' decision. Meanwhile, 14 respondents chose the option B, the 'risk taker' decision. This result shows that 68.2 per cent of the participants selected the 'less risk' option, and 31.8 per cent selected the 'risk taker' option to keep the investment (option B). This finding shows that when the applied theory was the *prospect theory* with a positive frame, and low responsibility, the participants were inclined to select the alternative answer by avoiding the risk (option A). This result is supported by previous findings from Chang, Yen, and Duh (2002). Thus, the result analytically proves that hypothesis 1b is supported.

The H2b testing was conducted upon each individual by using the case *treatment* symbolised by 'G'. The case was developed to describe the positively framed investment information (*positive frame*), and the answer was provided by using the *FTT* framework with a low responsibility. The analysis was completed by using a *cross tabulation*, as conducted by Chang, Yen, and Duh (2002) to describe the percentage of the applied *treatment* result.

Table 4 shows that when the options are stated in the *FTT* framework by having a positive frame, and low responsibility, of the 44 participants, 32 chose option A, the 'less risky' decision. Meanwhile, 12 respondents chose option B, the 'risk taker' decision. It shows that 72.27 per cent of the participants selected the 'less risk' option, and 27.3 per cent selected the 'risk taker' option to keep the investment (option A). This finding shows that when the

applied theory was the *FTT* with a positive frame, and low responsibility, the participants were inclined to select the alternative answer by avoiding the risk (option A). This result is supported by previous findings from Chang, Yen, and Duh (2002). Thus, the result analytically proves that hypothesis 2b is supported.

The H3b analysis was a hypothesis test to examine the predictive skill of each theory. The test was performed by comparing the preference level from each answer by differing the theoretical frameworks, high responsibilities, and positive information frames. As seen in Table 10, when the applied framework was the *prospect theory*, the results show 68.2 per cent of the participants chose option A, the ‘less risk’ decision. Meanwhile, 31.8 per cent chose to take the risk by continuing the investment (option B). When approached from the *FTT*, as the applied framework, it shows that 72.27 per cent of the participants chose the ‘less risk’ option (option A), while 27.3 per cent chose to take the risk by continuing the investment (option B). In Table 4, this result caused no significant differences to the results. This is shown by *Chi - Square* = 0.738, and *p* = 0.390. It can be concluded that there were no differences to an individual's decision making from the perspective of either theory when the information was presented in a *positive frame*, with low responsibility. Therefore, it can be concluded that H3b is supported systematically by using a *cross tabulation*. This finding explains the accuracy of the *FTT* prediction, rather than the *prospect theory* prediction. This finding is supported by a previous study conducted by Chang, Yen, and Duh (2002).

1c, 2c, and 3c Hypothesis Analysis

The H1c, H2c, and H3c analysis were completed by a hypothetical examination within the *prospect theory*, and the *FTT*. It was an examination of each individual towards the investment decisions presented in the *prospect theory*, and *FTT* with a positive frame, and high responsibility.

Table 5: High Negative Prospect vs High Negative Fuzzy

Theory	Options		N	Chi-Square Test	P-Value
	A	B			
Prospect	15 (34.1%)	29 (65.9%)	44	0.996	0.318
Fuzzy	13 (29.5%)	31 (70.5%)	44		

The H1c testing was conducted upon each individual by using the case *treatment* symbolised by ‘B’. The case was developed to describe the positively framed investment information (*negative frame*), and the answer was provided by using the *prospect theory* framework with a high responsibility. The analysis was performed by using a *cross tabulation*, as conducted by Chang, Yen, and Duh (2002) to describe the percentage of the applied *treatment* result.

As shown in Table 5, when the options are stated in the *prospect theory* by having a negative frame, and high responsibility, of the 44 participants, 15 chose option A, the ‘less risky’ decision. Meanwhile, 29 chose option B, the ‘risk taker’ decision. This result shows that 34.1 per cent of the participants selected the ‘less risk’ option, and 65.9 per cent selected the ‘risk taker’ option to keep the investment (option B). This demonstrates that when the applied theory was the *prospect theory* with a negative frame, and high responsibility, the participants were inclined to select the alternative answer by taking the risk (option B). This result is supported by previous findings from Robert W Rutledge and Harrell (1994). Thus, the result analytically proves that hypothesis 1c is supported.

The H2c test is a test upon each individual by using the case *treatment* symbolised ‘F’. The case was developed to describe the positively framed investment information (*negative frame*), and the answer was provided by using the *FTT* framework with a high responsibility. The analysis was performed by using a *cross tabulation*, as conducted by Chang, Yen, and Duh (2002) to describe the percentage of the applied *treatment* result.

Table 5 shows that when the options are stated in the *FTT* framework by having a negative frame, and high responsibility, of the 44 participants, 13 chose option A, the ‘less risky’ decision. Meanwhile, 31 chose option B, the ‘risk taker’ decision. This result shows that 29.5 per cent of the participants selected the ‘less risk’ option, and 70.5 per cent selected the ‘risk taker’ option to keep the investment (option B). This demonstrates that when the applied theory was the *FTT* with a negative frame, and high responsibility, the participants were included to select the alternative answer by taking the risk (option B). This result is supported by previous findings from Robert W Rutledge and Harrell (1994). Thus, the result analytically proves that hypothesis 2c is supported.

The H3c analysis was a hypothesis test to examine the predictive skill of each theory. As seen in Table 11, when the applied framework was the *prospect theory*, the result shows that 34.1 per cent of the participants chose option A, the ‘less risk’ decision. Meanwhile, 65.9 per cent chose to take the risk by continuing the investment (option B). When approached from the *FTT*, as the applied framework, it showed that 29.5 per cent of the participants chose the ‘less risk’ option (option A), meanwhile 70.5 per cent chose to take the risk by continuing the investment (option B).

In Table 5, this result caused no significant differences to the results. This is shown by *Chi - Square* = 0.996, and $p = 0.318$. It can be concluded that there were no differences to an individual's decision making from either the *prospect theory* or *FTT*. This finding is supported by a previous study conducted by Chang, Yen, and Duh (2002).

1d, 2d, and 3d Hypothesis Analysis

The H1d, H2d, and H3d analyses were completed by a hypothetical examination within the *prospect theory*, and *FTT*. It was examination of each individual towards the investment decisions presented in the *prospect theory*, and *FTT*, with a *positive frame*, and low responsibility.

Table 6: Low Negative Prospect vs Low Negative Fuzzy

Theory	Options		N	Chi-Square Test	P-Value
	A	B			
Prospect	14 (32.6%)	29 (67.4%)	43	0.027	0.869
Fuzzy	13 (30.2%)	30 (69.8%)	43		

The H1d testing was conducted upon each individual by using the case *treatment* ‘D’. The case was developed to describe the positively framed investment information (*negative frame*), and the answer was provided by using the *prospect theory* framework, with a low responsibility. The analysis was performed by using a *cross tabulation*, as conducted by Chang, Yen, and Duh (2002) to describe the percentage of the applied *treatment* result.

As shown in Table 6, when the options are stated in the *prospect theory* by having a negative frame, and low responsibility, of the 43 participants, 14 chose option A, the ‘less risky’ decision. Meanwhile, 29 chose option B, the ‘risk taker’ decision. This result shows that 32.6 per cent of the participants selected the ‘less risk’ option, and 67.4 per cent selected the ‘risk taker’ option to keep the investment (option B). This demonstrates that when the applied theory was the *prospect theory* with a negative frame, and low responsibility, the participants were inclined to select the alternative answer by taking the risk (option B). This result is supported by previous findings from Chang, Yen, and Duh (2002). Thus, the result analytically proves that hypothesis 1d is supported.

The H2d testing was conducted upon each individual by using the case *treatment* ‘H’. The case was developed to describe the positively framed investment information (*negative frame*), and the answer was provided by using the *FTT* framework, with a low responsibility. The analysis was performed by using a *cross tabulation*, as conducted by Chang, Yen, and Duh (2002) to describe the percentage of the applied *treatment* result.

Table 6 shows that when the options are stated in the *FTT* by having a negative frame, and low responsibility, of the 43 participants, 13 chose option A, the ‘less risky’ decision. Meanwhile, 30 chose option B, the ‘risk taker’ decision. This result shows that 30.2 per cent of the participants selected the ‘less risk’ option, and 69.8 per cent selected the ‘risk taker’ option to keep the investment (option B). This demonstrates that when the applied theory was

the *FTT*, with a negative frame, and low responsibility, the participants were inclined to select the alternative answer by taking the risk (option B). This result is supported by previous findings from Chang, Yen, and Duh (2002). Thus, the result analytically proves that hypothesis 2d is supported.

The H3d analysis was a hypothesis test to examine the predictive skill of each theory. The test was performed by comparing the preference level from each answer by differing the theoretical frameworks, high responsibilities, and negative information frames. As seen in Table 12, when the applied framework was the *prospect theory*, the result shows that 32.6 per cent of the participants chose option A, the ‘less risk’ decision. Meanwhile, 67.4 per cent chose to take the risk by continuing the investment (option B). When approached with the *FTT*, as the applied framework, it shows that 30.2 per cent of the participants chose the ‘less risk’ option (option A), while 69.8 per cent chose to take the risk by continuing the investment (option B).

In Table 6, this result caused no significant differences to the results. This is shown by *Chi - Square* = 0.027, and $p = 0.869$. It can be concluded that there were no differences to an individual's decision making from either theory, when the information was presented in a *negative frame*, with low responsibility. Therefore, it can be concluded that H3d is supported systematically by using a *cross tabulation*. This finding explains the accuracy of the *FTT* prediction, rather than the *prospect theory* prediction. This finding is supported by a previous study conducted by Chang, Yen, and Duh (2002).

Conclusion

This research examines two theories — the *prospect theory*, and *FTT* — in an effort to determine which theory is the most appropriate to predict, and explain the *framing* effects in making decisions. The test was performed on individuals by giving treatments consisting of responsibility, combination, and separation between the *domain problem*, and the *frame problem*, in making decisions.

The test proves that the *FTT* was stronger at explaining the effects of *framing* on individuals than the *prospect theory*. The findings are consistent with Reyna, V F. Brainerd (1991), that decision makers tend to use a simple, and brief information presentation or to process information qualitatively, when the information could be simplified.

In its predicting, and explaining efforts of *framing*, and responsibility effects in making decisions, this research suggests two matters. Firstly, when the information is presented in a *positive frame*, and in *negative frame*, and secondly, when an individual is being responsible upon his initial investment, and when an individual does not take responsibility. The *frame*



deals with how a fact or information is disclosed. The test was performed on individuals by combining, and separating the *domain problem*, and the *frame problem* on risky decision making, so there was a decision shift (*risky shift*). The *risky shift* is a shift of decision making taken by the decision makers when the *domain problem*, and *frame problem* are given to make a risky investment decision A & Kahneman. D, 1986; (Rcribert W Rutledge, 1994b; Susanto, 2012. After being statistically tested on the collected data, the obtained results confirmed that all hypotheses were supported empirically.

Limitation

The applied case in this research was simplistic, so there will be differences in the results when the applied cases are more realistic, and complex.

Implications of Research Findings

The findings of this research are expected to contribute a certain discourse about how we present information. As a result of noticing the influential factors towards individuals in making decisions, this is expected to make us more qualified in making decisions. This quality improvement could be achieved by framing more appropriate information in accordance with the purpose, and targeted decisions. We could also provide the information positively, if we wanted any decision to avoid risk, and vice versa. Other types of management accounting decision making also perform It is important because decision-making within the business field cannot be completed only by the manager, personally. However, it is a collective agreement, which leads to a collective managerial decision. Thus, it will be interesting if further researchers compare whether there are differences in decision-making preferences, which are based on the decision types.



REFERENCE

- a, tversky. and kahneman. d. (1986). rational choice and the framing of decisions. *the journal of business*, vol. 59, no. 4, pp. 251–78.
- amos tversky and daniel k. (1979). prospect theory: an analysis of decisions under risk. *econometrica*, vol. 47, pp. 263–91.
- anderson, k. 1999. decision–making traps. *broadcast engineering*, vol. 41. pp. 147-161.
- ashton, a. dan r.h. ashton. 1988. sequential belief revision in auditing. *the accounting review*, vol. 18, no. 4, pp. 623 – 641.
- chang, c. janie, sin-hui y. and rong-ruey, d. (2002). an empirical examination of competing theories to explain the framing effect in accounting-related decisions.” *behavioral research in accounting*, vol. 14, no. 1, pp. 35–64.
- chang, c. j. (2002). an empirical examination of competing theories to explain the framing effect in accounting-related decisions. *behavioral research in accounting*, vol. 14, no. 14, pp. 147-156.
- klaczynski, p. a. and g. n. (1998). representations as mediators of adolescent deductive reasoning. *developmental psychology*, vol. 34, pp. 865–81.
- kuhberger, a. (1995). khberger1995.pdf. *organization behavior and human decision processes*, vol. 62, pp. 230–40.
- main, d. j. (1998). improving your decision making. *businnes and economics review*, vol. 44. no. 16, pp. 13.
- neale, m. a, and max, h b. 1985. the effects of framing and negotiator overconfidence on bargaining behaviors. *academy of management journal*, vol. 34. no. 16, pp. 16.
- reyna, v. f. brainerd, c. j. (1991). fuzzy trace theory and framing effects in choice. *journal of behavioral decision making*, vol. 4, pp. 249–62.
- reyna, v. f. and charles j. b. (1990). fuzzy processing in transitivity development. *annals of operations research*, vol. 23, no. 1, pp. 37–63.
- reyna and ellis. 1994. fuzzy-trace theory and framing effects in chlldrens risky decision making. *psychological science*, vol. 5, pp. 275–279.
- rutledge, r. w. (1994a). the impact of responsibility and framing of budgetary information on



group-shifts, *vol.* 6, pp. 146-156.

rutledge, r. (1994b). the impact of responsibility and framing of budgetary information on group-shifts, *vol.* 6, no. 4, pp. 171-179.

rutledge, r. w, and adrian, m. h. (1994). the impact of responsibility and framing of budgetary information on group-shifts. *behavioral research in accounting*, *vol.* 6, pp. 92–109. <http://search.ebscohost.com/login.aspx?direct=true&db=bth&an=9352298&site=ehost-live>.

stone, e. r. f. yates, and parker, a. m. (1994). risk communication: absolute versus relative expressions of low-probability risks. *Organizational Behavior and Human Decision Processes*, *Vol.* 60, pp. 387–408.

Susanto, B. (2012). Pengaruh tanggungjawab , motivasi intrinsik dan pembingkaiian informasi anggaran dalam pengambilan keputusan investasi dengan group-shifts sebagai variabel pemoderasi (Studi Eksperimen). *Jurnal Analisis Bisnis Ekonom*, *Vol.* 10, No. 1, pp. 9–16.

Tversky, A. and Daniel. K. (1986). Rational Choice and the Framing of Decisions, *Vol.* 59, No. 4, pp. 156-172.

Wang, X.T. (2004). Self-framing of risky choice. *Journal of Behavioral Decision Making*, *Vol.* 17, No. 1, pp. 1–16.